Introduction

In this contribution we compare three different quantitative studies carried out at the University of Klagenfurt. They use three different types of methods (A, B, C below) but reveal similar results suggesting the general rule “more frequent before less frequent”. (A) may be qualified as a corpus based study, (B) is some sort of (hypothesis-guided) text analysis, and (C) an experimental study:

A: Word order in freezes

The respective study (Fenk-Oczlon, 1989) was based on the assumption that the word order in frozen binomials is determined by the rule “more frequent before less frequent” and that this rule would show a higher predictive power than rules such as “short before long”, “the first word has fewer initial consonants”, “me-first principle”, etc. This assumption was tested on 400 freezes from English, Russian and German using the corresponding statistical data (from Thorndike and Lorge, Josselson, Meier, Ruoff). The results include the following:

- With 84% correct predictions the new rule achieves by far the highest accuracy.
- In paired comparisons (all possible combinations of five rules) no other rule achieves such a high degree of correspondence.
- In order to explain those freezes which represent an exception to our rule, recourse must be had primarily to the iconic coding of spatial-temporal relationships.

Jordan (1999) analyzed a total of 579 freezes from French, Italian, and Spanish. In all of these languages our frequency rule showed a higher predictive power than the competing rules.

B: Function words before content words

In a previous psycholinguistic study by Auer, Bacik & Fenk subjects were asked to recall as many words as possible from certain sentences of a text by Ernst von Glasersfeld. In a statistical reanalysis (Fenk & Fenk-Oczlon 2006) we found a significantly higher proportion of function words in the primacy part (first quarter) and of content words in the recency part (last quarter) of the sentences. To find out whether this tendency was a characteristic only of the author Glasersfeld we inspected texts – each third of a sentence, if at least 4 words long – from 9 further German authors (4 scientific and 5 literary texts). Table 1 and Figure 1 show the differences between the first and the last quarter of 10 sentences from each of the 10 authors (Fenk-Oczlon & Fenk, 2002).
Table 1: Differences in the distribution of word classes (data material: 10 sentences from each of 10 different German authors)

<table>
<thead>
<tr>
<th></th>
<th>1. quarter</th>
<th>4. quarter</th>
<th>diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>function</td>
<td>3.36</td>
<td>2.67</td>
<td>sign. p&lt;.01</td>
</tr>
<tr>
<td>content</td>
<td>2.74</td>
<td>3.46</td>
<td>sign. p&lt;.01</td>
</tr>
<tr>
<td>diff.</td>
<td>sign. p&lt;.05</td>
<td>sign. p&lt;.01</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: The mean number of function words decreases as the mean number of content words increases (data material: 10 sentences from each of 10 different German authors)

Müller (2005) proved these effects in 30 texts (300 sentences) from 3 different Romance languages: In French and Italian the crossing of the two curves to be seen in our Figure 1 shows very late, i.e. near the end of the sentence; in Latin there is no crossing at all. But all of these languages show an increase of content words and a decrease of functions words in the course of a sentence.

C: Behaghels “Gesetz der wachsenden Glieder”

Behaghel (1909) illustrates his law of increasing elements or constituents with many examples from classical texts in a variety of languages such as Ancient Greek, Latin, Old High German and German. In most of his examples the comparison was between word groups of different size or between single words and word groups: auf der Türbank und im dunklen Gang (p.110). In a little experiment by Behaghel the subjects got four sheets of paper with the following words and word groups: Gold / edles Geschmeide / und / sie besitzt. They were instructed to form a sentence from these fragments, and the result was always the same: Sie besitzt Gold und edles Geschmeide. His explanation: More complex constituents are prepared in the course of sentence production; to place them rather at the end of the sentence meets the cognitive requirements of both, the speaker and the hearer of the sentence. Arnold & Wasow
(2000:28) focus on the role of the hearer when they “argue that postponing heavy and new constituents facilitates processes of planning and production.”

In a recent experiment (Fenk & Brunner, 2008) Behaghel’s law was tested in a more systematical way, i.e. with varying text material and a higher number of subjects, so that a multiple choice procedure was more appropriate than Behaghel’s constructional method. In each of the items the 328 subjects could choose between different sentences such as Im Labor befanden sich Schafe und Wissenschaftler versus Im Labor befanden sich Wissenschaftler und Schafe. Other than in Behaghel, the test was primarily on the lexical level and was arranged as a competition between Behaghel’s “short before long” and our rule “more frequent before less frequent”. Each questionnaire contained an equal number of items where the first one of the critical words was short and frequent (a), long and frequent (b), short and rare (c), or long and rare (d).

Assuming that Behaghel’s law would also show under these conditions but would be weaker than our frequency rule, the predicted rank order of preferences was a > b > c > d. The respective differences (661 > 615 > 371 >321) as well as the differences between more frequent and less frequent turned out to be highly significant; the difference between short versus long was much lower.

Discussion

The studies (A) and (C) offer a direct comparison between the two regularities “short before long” versus “more frequent before less frequent”, and the latter is the clear winner. This shows not only in the binomials (A) where no “hard” syntactical constraints are effective. It seems to be a very robust effect showing in sentences as well: Behaghel found his law, first of all, in texts of different authors from different languages and different periods despite all the syntactical constraints effective in sentence construction. Our experiment (C) exhibits frequency rather than shortness as the relevant factor. Thus both (A) and (C) provide arguments for assuming frequency as the dominant factor, and with respect to (B) we may at least claim that function words tend to be both short and frequent. Therefore the results of all these studies may be subsumed under the covering law “more frequent before less frequent”. This rule contributes to a relatively constant flow of linguistic information: The more frequent and thus more familiar elements obtain those initial positions which are per se characterized by a higher informational content. That the information, e.g., the uncertainty, is highest in the initial positions of a sequence, is almost trivial from the point of view of information theory and thus also shows in the application of Shannon’s (1951) guessing game technique: highest number of errors in the initial positions of sentences, of words, and of syllables (cf. Fenk & Vanoucek 1992: 54). In the course of a sequence the number of errors decreases due to the decreasing number of plausible continuations.

We will argue that the principle of a relatively constant flow of linguistic information is an economy principle and thus incompatible with Croft’s (1990: 159) claim that word order is unaffected by such tendencies.
References


